# Queclink
## WIRELESS SOLUTIONS

GPS Locator **GV300**
# User Manual

TRACGV300UM001

Revision: 1.03

http://www.queclink.com

sales@queclink.com

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WARNING:Changes or modifications to this unit not expressly approved by the party responsi ble  for compliance could void the user's authority to operate the equipment.

For the product, under normal use condition is at least 35 cm away from the body of the user,the user must keeping at least 35cm distance to the product.

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**Revision History**

| Revision | Date | Author | Description of change |
|----------|------|--------|----------------------|
| 1.00 | 2011-8-10 | Owen Feng | Initial |
| 1.01 | 2011-8-19 | Owen Feng / Lei/Vivi | First review |
| 1.02 | 2011-09-09 | Owen Feng | Add picture of new case(V3) |
| 1.03 | 2011-09-27 | Owen Feng | 1- add "Switch ON the Backup Battery" 2- add new feature output with PTC over current protection |
| 1.04 | 2011-10-10 | Owen Feng | 1-page 7 add notes of FCC |

## 1. Introduction

The GV300 is a powerful GPS locator designed for vehicle or asset tracking. It has superior receiver sensitivity, fast TTFF (Time to First Fix) and supports Quad-Band GSM frequencies 850/900/1800/1900, its location can be monitored in real time or be periodically tracked by a backend server or other specified terminals. The GV300 has multiple input/output interfaces that can be used for monitoring or controlling external devices. Based on the integrated @Track protocol, the GV300 can communicate with a backend server through the GPRS/GSM network to transfer reports of Emergency, geo-fence boundary crossings, low backup battery or scheduled GPS position as well as many other useful functions. Users can also use GV300 to monitor the status of a vehicle and control the vehicle by its external relay output. System Integrators can easily setup their tracking systems based on the full-featured @Track protocol.

This device complies with part 15B, part 22 and part 24 of the FCC rules. Operation is subject to the following two conditions:　　(1) this device may not cause harmful interference　　(2) this device must accept any interference, including interference that may cause　undesired operation.

### 1.1. Reference

**Table 1: GV300 Protocol Reference**

| SN | Document name | Remark |
|----|---------------|--------|
| [1] | GV300 @Track Air Interface Protocol | The air protocol interface between GV300 and backend server. |

### 1.2. Terms and Abbreviations

**Table 2: Terms and Abbreviations**

| Abbreviation | Description |
|--------------|-------------|
| AGND | Analog Ground |
| AIN | Analog Input |
| DIN | Digital Input |
| DOUT | Digital Output |
| GND | Ground |
| MIC | Microphone |
| RXD | Receive Data |
| TXD | Transmit Data |
| SPKN | Speaker Negative |

| SPKP | Speaker Positive |
|------|------------------|

## 2. Product Overview

### 2.1. Check Part List

Before starting, check all the following items have been included with your GV300. If anything is missing, please contact your supplier.



**Figure 1.    Appearance of GV300**

## 2.2. **Parts List**

**Table 3: Part List**

| Name | Picture |
|------|---------|
| GV300 Locator | 80*49*26 mm |
| User Cable |  |
| Extend Cable (Optional) |  |
| GPS Antenna (Optional) |  |

## 2.3. **Interface Definition**

The GV300 has a 16 PIN interface connector. It contains the connections for power, I/O, RS232, microphone, speaker, etc. The sequence and definition of the 16PIN connector are shown in following figure:



**Figure 2.     The 16 PIN connector on the GV300**

**Table 4: Description of 16 PIN Connections**

| Index | Description | Comment |
|---|---|---|
| 1 | MICP | Single end, 2-2.2k microphone, internal bias |
| 2 | AGND | Analog ground |
| 3 | IGN | Ignition input, positive trigger |
| 4 | RXD | UART RXD, RS232 |
| 5 | TXD | UART TXD, RS232 |
| 6 | GND | Power and digital ground |
| 7 | OUT3 | Open drain, 150mA max |
| 8 | OUT2 | Open drain, 150mA max |
| 9 | EARP | Differential output, 32ohm 1/4w speaker |
| 10 | EARN | Differential output, 32ohm 1/4w speaker |
| 11 | PWR | External DC power input, 8-32V |
| 12 | IN2 | Digital input, negative trigger |
| 13 | IN1 | Digital input, negative trigger |
| 14 | OUT1 | Open drain, 150mA max ,with latch circuit |
| 15 | AD1/IN3 | Multifunction input, analog or digital input |
| 16 | AD2 | Analog input 0-2.8v |

# 3. Getting Started

## 3.1. Opening the Case
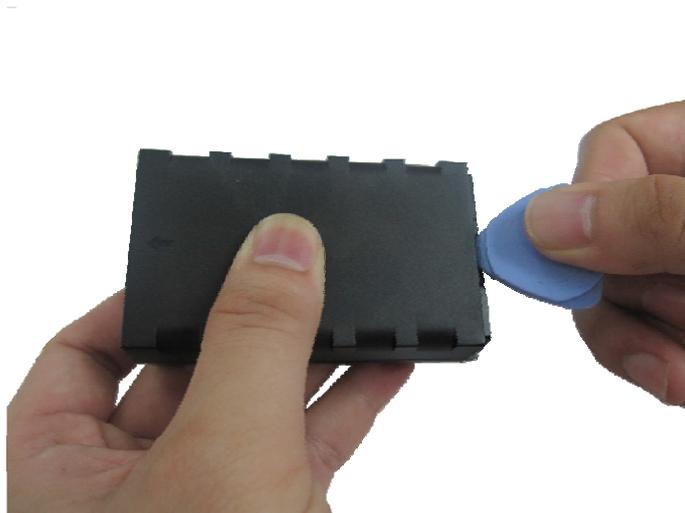


**Figure 3.    Opening the Case**

Insert the triangular-pry-opener into the gap of the case as shown below, push the opener up until the case unsnapped.

## 3.2. Closing the Case



**Figure 4.    Closing the Case**

Place the cover on the bottom in the position as shown in the following figure. Slide the cover against the direction of the arrow until it snapped.

### 3.3. **Installing a SIM Card**

Open the case and ensure the unit is not powered (unplug the 16Pin cable and switch the internal battery to off position). Slide the holder right to open the SIM card. Insert the SIM card into the holder as shown below with the gold-colored contact area facing down taking care to align the cut mark. Close the SIM card holder. Close the case.
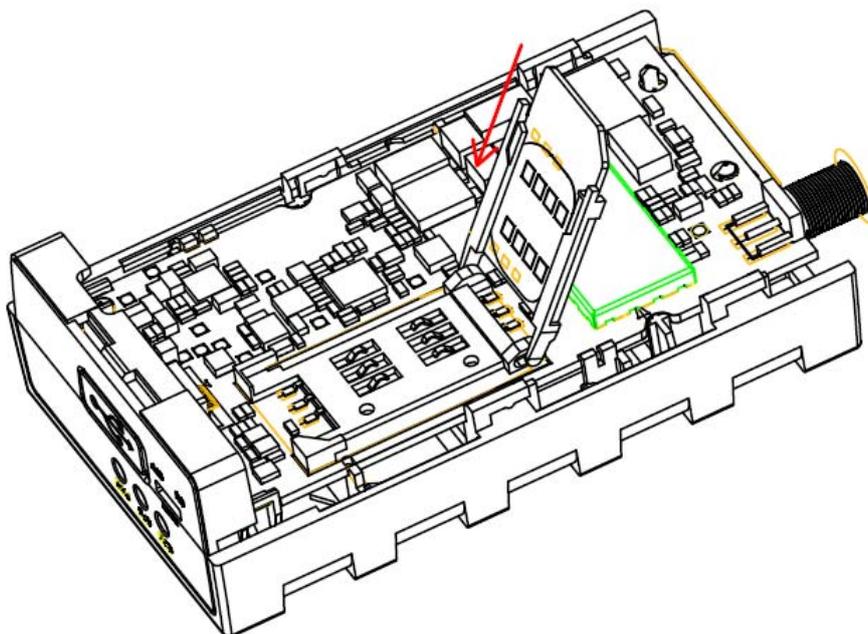


**Figure 5.      SIM Card Installation**

### 3.4. **Installing the Internal Backup Battery**



**Figure 6.      Backup Battery Installation**

There is an internal backup Li-ion battery,

## 3.5. **Switch ON the Backup Battery**

To use the GV300 backup battery, the switch must be at the ON position. Switch on the case and ON/OFF position are shown below.



**Figure 7.     Switch and ON/OFF position**

Note:
The switch must be on the "OFF" position when shipped on an aircraft.

## 3.6. **Installing the External GPS Antenna (Optional)**

There is a SMA GPS antenna connector on GV300. The GV300 will automatically detect and use an external antenna when connected.

**Figure 8.    GPS Antenna of GV300**

### 3.6.1.  GPS Antenna Specification

**Table 5: GPS Antenna Specification**

| GPS antenna: | Frequency: 1575.42MHz |
|---|---|
| Bandwidth: | >5MHz |
| Beam width: | >120 deg |
| Supply voltage: | 2.7V-3.3V |
| Polarization: | RHCP |
| Gain: | Passive: 0dBi min |
| | Active:   15dB |
| Impedance: | 50Ω |
| VSWR: | <2 |
| Noise figure: | <3 |

### 3.7. Power Connection

PWR (PIN12) / GND (PIN6) are the power input pins. The input voltage range for this device is from 8V to 32V. The device is designed to be installed in vehicles that operate on 12V or 24V systems without the need for external transformers.
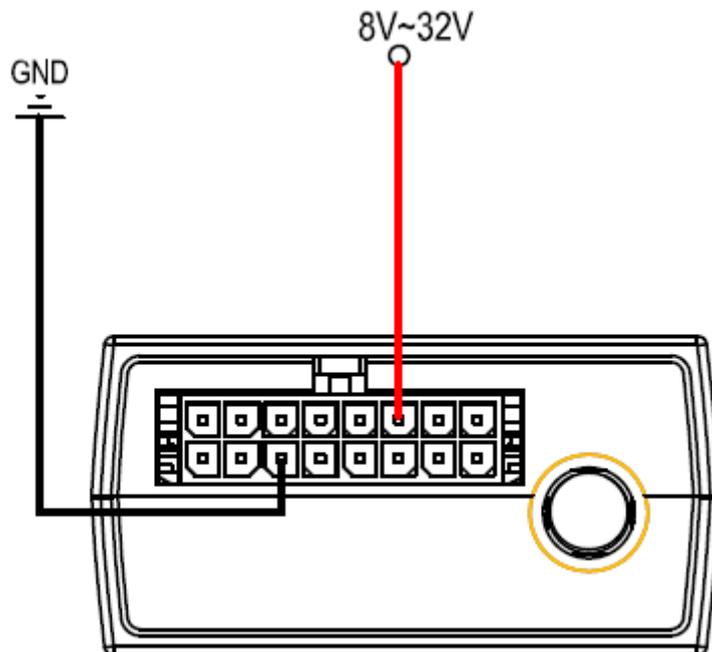


**Figure 9.    Typical Power Connection**

## 3.8. Ignition Detection

**Table 7: Electrical Characteristics of Ignition Detection**

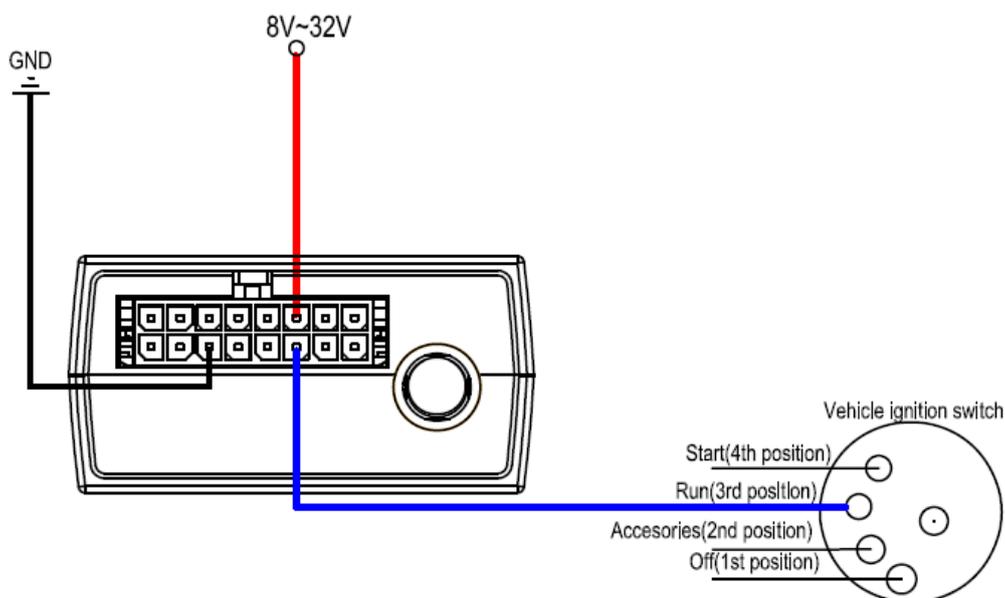| Logical State | Electrical State |
|---|---|
| Active | 5.0V to 32V |
| Inactive | 0V to 3V or Open |



**Figure 10.    Typical Ignition Detection**

IGN (Pin3)is used for ignition detection. It is strongly recommended to connect this pin to ignition key "RUN" position as shown up.

An alternative to connecting to the ignition switch is to find a non permanent power source that is only available when the vehicle is running. For example the power source for the FM radio.

IGN signal can be configured to start transmitting information to backend server when ignition is on; and enter power saving mode when ignition is off.

## 3.9. Digital Inputs

There are three general purpose digital inputs on GV300. They are all negative trigger.

**Table 6: Electrical Characteristics of the digital inputs**

| Logical State | Electrical Characteristics |
|---|---|
| Active | 0V to 0.8V |
| Inactive | Open |

The following diagram shows the recommended connection of a digital input.
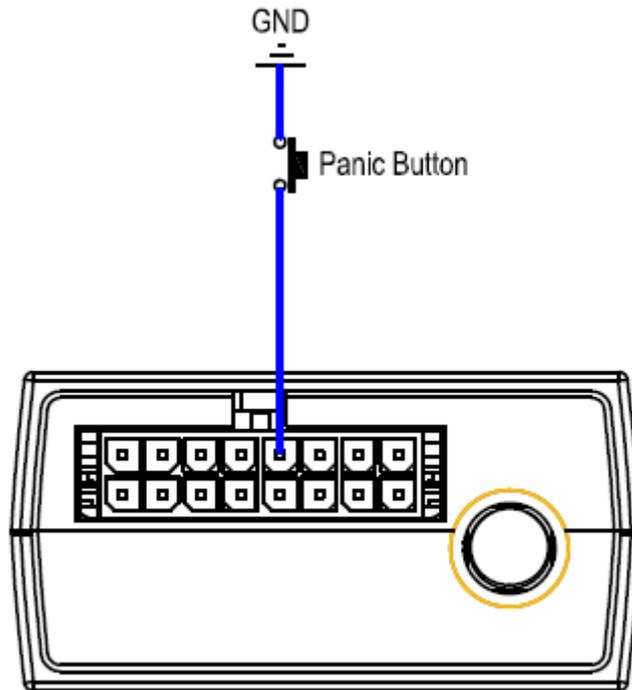
**Figure 11. Typical Digital Input Connection**

### 3.10. Analog Inputs

There are two analog inputs on GV300, the analog input voltage range is from 0 to 2.8V. The following diagram shows the recommended connection.
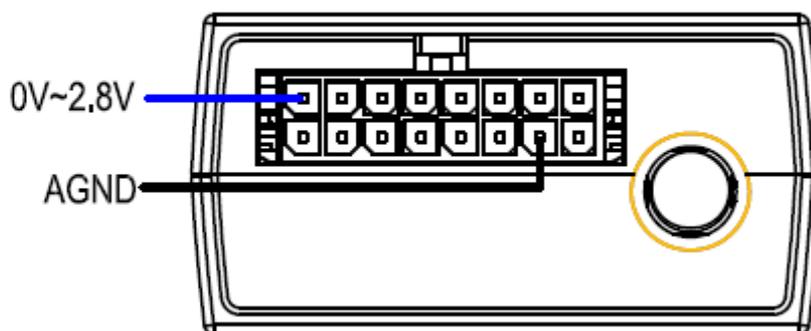


**Figure 12. Typical Analog Input Connection**

Note:

PIN 15 is an multifunction pin: it can be configured as a digital input or an analog input.

## 3.11. Digital Outputs

There are three digital outputs on GV300. All are of open drain type and the maximum drain current is 150 mA. Each output has the built-in over current and recovery PTC fuse
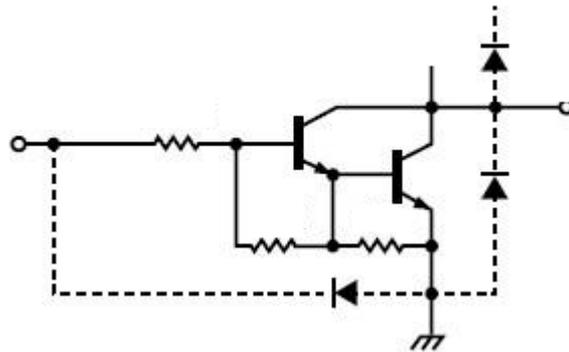


**Figure 13.   Digital Output Internal Drive Circuit**

**Table 7: Electrical Characteristics of Ddigital Outputs**

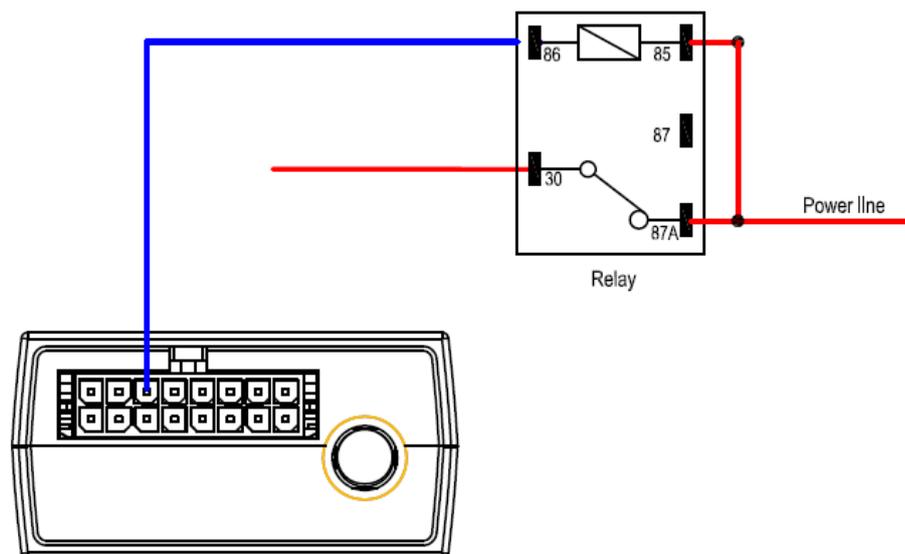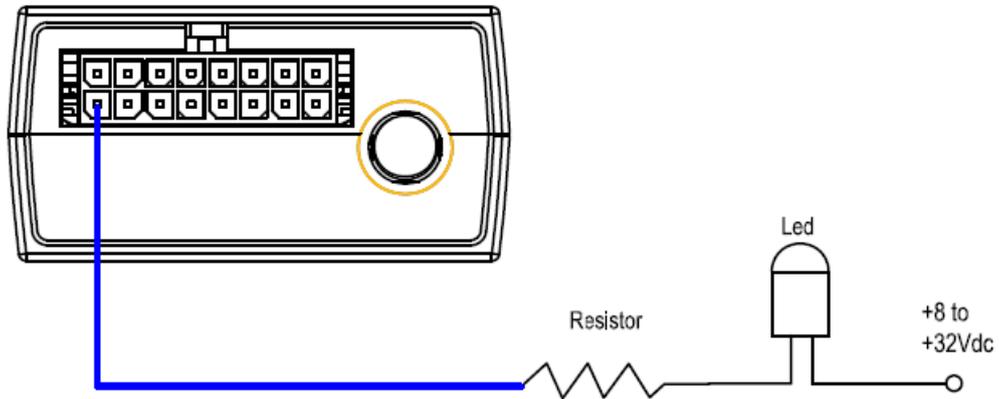| Logical State | Electrical Characteristics |
|---|---|
| Enable | <1.5V @150mA |
| Disable | Open drain |



**Figure 14.   Typical Connection with Relay**

**Figure 15.    Typical Connection with LED**

Note:

1 - OUT1 will latch the output state during reset.

2-  All outputs are internally pulled up to PWR pin by a diode. So no external flyback diode is needed when the output is connected to an inductive load.
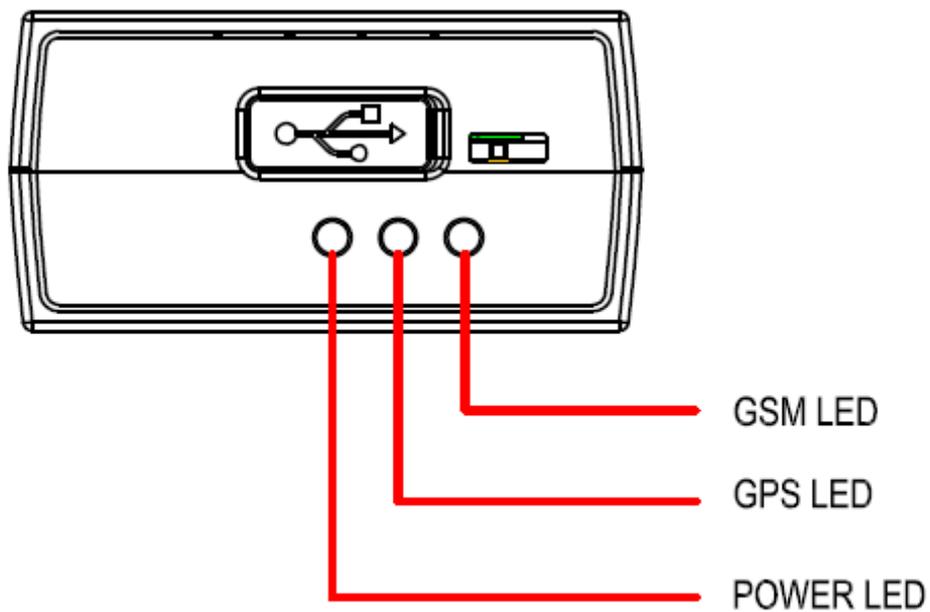
3.12. **Device Status LED**



**Figure 16.    GV300 LED on the Case**

**Table 8: Definition of Device status and LED**

| LED | Device status | LED status |
|-----|---------------|------------|
| GSM (note1) | Device is searching GSM network | Fast flashing (Note3) |
| | Device has registered to GSM network. | Slow flashing (Note4) |
| | SIM card needs pin code to unlock. | ON |
| GPS (note 2) | GPS chip is powered off | OFF |
| | GPS sends no data or data format error. | Slow flashing |
| | GPS chip is searching GPS info. | Fast flashing |
| | GPS chip has gotten GPS info. | ON |
| PWR (note 2) | No external power and internal battery voltage is lower than 3.35V. | OFF |
| | No external power and internal battery voltage is below 3.5V. | Slow flashing |
| | External power in and internal battery is charging | Fast flashing |
| | External power in and internal battery is fully charged | ON |

Note:

1 - GSM LED cannot be configured.

2 - GPS LED and PWR LED can be configured to turn off after a period of time using the configuration tool

3 - Fast flashing is about 60ms ON/ 780ms OFF

4 - Slow flashing is about 60ms ON/ 1940ms OFF

### 3.13. **Audio Interface**

The GV300 offers a pair of differential outputs for an audio speaker and a signal-end microphone input. The audio output can be directly connected to 32ohm 0.25 w speaker. To achieve higher power output, please use an external audio amplifier (not supplied)
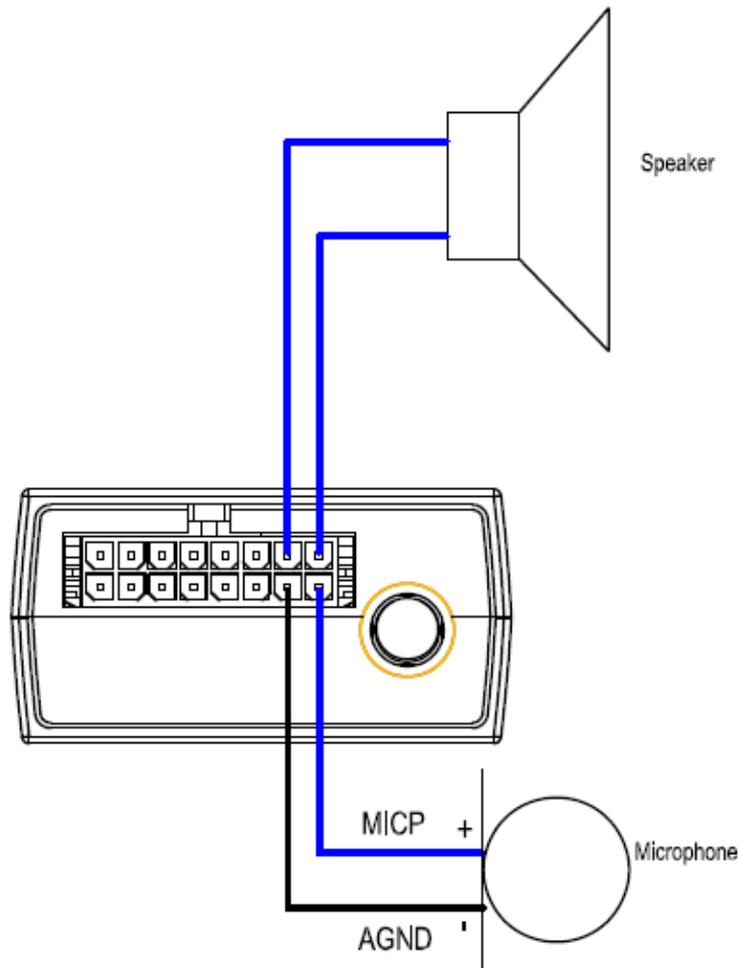
**Figure 17.     Typical Audio Connection**

### 3.13.1. Microphone Input Characteristics

**Table 9: The Characteristics of Microphone**

| Parameter | Min | Typ | Max | Unit |
|---|---|---|---|---|
| Working Voltage | 1.0 | 1.5 | 2.0 | V |
| Working Current | 200 | | 500 | uA |
| External Microphone Load Resistance | | 2.2 | | k Ohm |

Notes:

1 - Using electret microphone, sensitivity of -42 ± 3 dB/Pa @ 2V, impedance 2.2kΩ.

2 - For RF noise suppression, two capacitors that 10pF and 33pF are recommended to be included within the microphone.

## 3.14. **Serial Port / UART Interface**

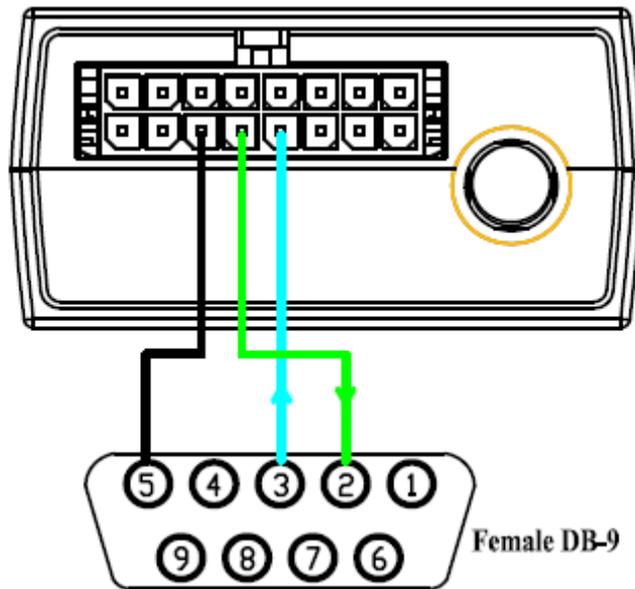There are two lines dedicated to the Serial Port / UART interface (TXD and RXD).TXD / RXD are standard RS232 signal.



**Figure 18.    Typical Connection with RS232 Port**